

# Hernias and Hydroceles

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Author Disclosure  
Dr Palmer has disclosed no financial relationships relevant to this article. This commentary does not contain discussion of unapproved/investigative use of a commercial product/device.

## Practice Gap

Medical management of hernias and hydroceles has changed; pediatricians need to be aware that the urgency to surgically correct these entities depends on the nature of the hernia or hydrocele and the likelihood of incarceration or spontaneous resolution.

## Objectives

After completing this article, readers should be able to:

1. Derive the differential diagnosis of a mass in the inguinal area in an infant: hydrocele, inguinal hernia, trauma, or tumor.
2. Understand the history and physical examination differences between an inguinal hernia and a hydrocele.
3. Plan the evaluation of a patient with a mass in the inguinal area.
4. Appreciate the principles in the surgical management of the hernia and hydrocele in infants and children.

Hernias and hydroceles present within embryologic and clinical continuums that are commonly encountered by pediatricians. These conditions are typically discovered by pediatricians on routine physical examination or after a bulge in the groin and/or scrotum is noted by the child's caretaker. The common nature of the inguinal hernia-hydrocele is documented by autopsy studies reporting an incidence of a patent processus vaginalis in 80% to 94% in newborn infants. The importance of identifying these conditions based on the history and physical examination findings lies in averting their complications and ensuring proper referral for further management.

## Embryology of the Inguinal Canal

Inguinoscrotal abnormalities in children are best understood by reviewing the underlying embryology of testicular descent and the inguinal region development. At approximately 6 weeks of gestation, the primitive germ cells migrate from the yolk sac to the genital ridge located high on the posterior wall of the abdomen where they differentiate into a testis or an ovary during the next 2 weeks. During the next few weeks of fetal elongation, the gonad becomes located near the internal inguinal ring at 3 months of gestation. During the third month and before testicular descent, the peritoneum bulges into the inguinal canal as the processus vaginalis. The gubernaculum forms from the caudal end of the mesonephros and is attached to the lower pole of the testis, where it serves to guide its descent into the scrotum. Starting in the seventh month of gestation, the testes descend through each inguinal canal, pushing the vaginalis ahead of it toward the scrotum during a few days, and then migrate from the external ring to the lower scrotum during the next 4 weeks.

The process vaginalis obliterates after testicular descent is complete. The portion of the processus vaginalis that is adjacent to the testes becomes the tunica vaginalis. Failure of the processus vaginalis to obliterate leads to the clinical entities described below.

In girls, the canal of Nuck, corresponding to the processus vaginalis in girls, usually obliterates earlier and enters into the labium majora. The gubernacular remnant in girls becomes the ovarian and uterine ligaments.

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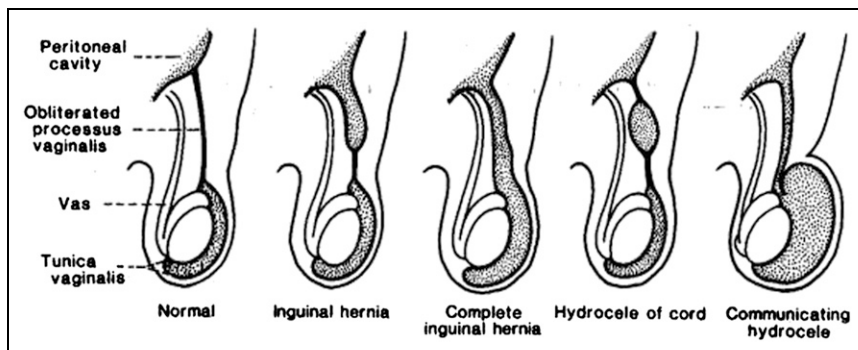


Figure 1. Hernia and hydroceles. From Palmer LS. Scrotal swelling and pain. In: McInerney TK, Adam HM, Campbell D, Kamat DK, Kelleher KJ, eds. *American Academy of Pediatrics Textbook of Pediatric Care*. Elk Grove Village, IL: American Academy of Pediatrics; 2009:1717–1724.

## Definitions

### Indirect Inguinal Hernia

Complete failure of the processus vaginalis to obliterate leads to a large communication between the abdomen at the level of the internal ring and the testis (Figure 1). The protrusion of intra-abdominal contents into the peritoneal sac defines the hernia. These contents include omentum/bowel or ovary/fallopian tube, and they may extend distally from the inguinal region to the scrotum or labia. Therefore, most indirect inguinal hernias are congenital.

### Communicating Hydrocele

Communicating hydrocele is the presence of peritoneal fluid in a patent processus vaginalis that protrudes across the internal inguinal ring and extends distally ending along the inguinal canal or reaching the scrotum.

### Hydrocele of the Spermatic Cord

Hydrocele of the spermatic cord is a fluid collection present along the spermatic cord between the obliterated portion of the processus vaginalis proximally from the internal ring and distally to the tunica vaginalis surrounding the testicle.

### Scrotal Hydrocele

Scrotal hydrocele is the presence of fluid surrounding the testicle that is contained by the tunica vaginalis while the processus vaginalis is obliterated from the internal ring to the upper extent of the tunica vaginalis.

## Epidemiology

The incidence rate of inguinal hernias is roughly 1% to 4% or approximately 10 to 20 per 1000 live births. The incidence

is highest in neonates and infants and decreases with age. Hernias are reported in up to 30% of premature hernias. Among full-term infants, the incidence of hernias is highest in the first year of life, peaking with approximately one-third presenting in the first 6 months, predominantly in the first few months. Several studies report a male predilection (6:1). The predilection for a right-sided (56.2%) patent processus vaginalis is likely related to later descent of the right testis and obliteration of the processus vaginalis. Left-sided (27.5%) hernias are more likely to be associated with an occult right-

sided hernia. Hernias are present bilaterally in 16.2%; the incidence rate of bilateral congenital inguinal hernia based on a range from several retrospective and a few prospective studies is approximately 15% to 25%. A family history of inguinal hernias is reported in approximately 20% of probands, and similarly there is a higher incidence among twins. Although an inguinal hernia is usually an isolated finding, there are several associated conditions of which the pediatrician should be aware (Table 1).

## Signs and Symptoms

An inguinal hernia and a communicating hydrocele typically present as a painless bulge localized to the groin or extending along the cord structures to the hemiscrotum or into the vulva in girls (Figure 2). The bulge is usually

Table 1. **Conditions Associated With an Inguinal Hernia**

Prematurity
Positive family history
Presence of a ventricoperitoneal shunt
Cystic fibrosis
Ascites
Congenital dislocation of the hip
Undescended testis
Hypospadias
Disorders of sexual differentiation
Exstrophy–epispadias complex
Prune belly (triad or Eagle–Barrett) syndrome
Ehlers–Danlos syndrome
Hunter–Hurler syndrome
Marfan syndrome



**Figure 2.** Inguinal bulge present in the upper right hemiscrotum in a male (left) and into the right labium majus in a girl (right).

painless and may be present at all times or only during periods of increased intra-abdominal pressure, such as during crying or bowel movements. The bulge may not be detectable when the child is supine and the peritoneal fluid or intra-abdominal contents spontaneously pass back into the abdomen. It is helpful to determine whether the bulge is smallest during sleep and larger when the child is standing. This intermittent presence of the bulge distinguishes the reducible inguinal hernia and communicating hydrocele from a scrotal hydrocele or hydrocele of the spermatic cord. The child with an incarcerated inguinal hernia will have a bulge that does not reduce spontaneously. With incarceration, the child may be irritable or inconsolable, have decreased appetite, and present with signs of bowel obstruction (abdominal distention, vomiting, and lack of flatus or stool).

The scrotal hydrocele may be present from birth or appear after an inflammatory or infectious process or after scrotal trauma. The size of the hydrocele may vary and even extend proximally through the inguinal canal to the internal ring, making it difficult to distinguish from a hernia or communicating hydrocele. The hydrocele of the spermatic cord is also generally painless and variable in size. It may be confused for the testis because of its round-oval shape.

### Physical Examination

Although the history is important, the physical examination is vital in determining the nature of the inguinoscrotal abnormality. Because most of these children are not yet walking, most examinations start with the child in the supine position. The older child should first be

examined in the standing position. Inspection should start at the lower abdomen in the area of the lower skin creases and then proceed along the inguinal canal into the scrotum. The presence of a bulge or asymmetry between the 2 sides should be sought. If the child is crying, the examiner should try to assess whether a bulge becomes present or increases during that time and improves or disappears when the child is consoled. Having the older child jump up and down several times may facilitate protrusion of the bulge.

Palpation moving systematically in a craniocaudal direction should start on the asymptomatic side followed by the reported symptomatic side. Gentle palpation to determine presence of swelling begins by using 1 to 2 fingers first in the area superior and lateral to the pubic tubercle, proceeding along the cord structures of the inguinal ring and ending in the scrotum. The proximal and distal extent of the swelling needs to be determined, if possible, to help make the diagnosis. Hernias and communicating hydroceles start at the level of the internal ring and can end at variable locations. Applying gentle pressure upward and slightly laterally can frequently reduce the contents of the hernia sac. The palpation of a silk-stocking sign implies thicker cord structures (ie, the presence of a hernia) and is sought by rubbing the cord structures side to side near the pubic tubercle. The sensation is that of rubbing silk together. A hydrocele of the spermatic cord may feel like a testis because of its shape. The examiner should be able to palpate cord structures both above and below the round-oblong hydrocele and a separate testis distally. Scrotal hydroceles vary in size and may be difficult to distinguish from a hernia when a scrotal hydrocele extends up to the internal ring. In general, the examiner should be able to palpate the cord structures above the superior aspect of the hydrocele. The fluid surrounding the testicle contained by the tunica vaginalis should transilluminate using a bright light; however, neonatal bowel may also transilluminate, leading to uncertainty as to the diagnosis. The examiner should assess the presence and nature of the 2 testes. The palpation of a normal testis and the bulge above it indicates the entity to be a hernia or hydrocele of the cord. In a hydrocele, the testis may be palpable within the surrounding fluid unless the hydrocele is tense, in which case the testis may not be discerned.

## Laboratory and Radiologic Imaging

The accurate diagnosis of a hernia and/or hydrocele is most commonly made based on the history and physical examination, thus making the use of adjuvant studies relatively unnecessary. Serum studies should be ordered when there is concern for bowel obstruction of an incarcerated hernia. Imaging is often of limited utility. Herniography is of historical interest in which water soluble contrast was injected infraumbilically into the abdomen and delayed pelvic radiographs were taken to see contrast in a hernia sac. Ultrasonography can be helpful in identifying an elongated echolucent area from the groin that extends anteromedially in the spermatic cord. However, this is not commonly found when the hernia sac is small. Other times omentum or bowel with its attendant peristalsis can be identified in a large hernia sac. In the presence of a presumed hydrocele, a sonogram can be helpful to identify the presence of an unpalpable testicle surrounded by hydrocele fluid. Ultrasonography is useful in identifying the presence of blood surrounding the testis in a child with a history of scrotal trauma or the presence of a solid testicular mass.

## Incarceration

Incarceration of the hernia, or the inability of the hernia to spontaneously reduce, occurs in 6% to 18% of patients and in 30% of infants younger than 2 months. This high incidence emphasizes the need to repair a hernia fairly promptly in young children. Structures that may become incarcerated include small bowel, appendix, omentum, colon, Meckel diverticulum, ovary, or fallopian tube. The signs and symptoms of incarceration include a hard bulge present in the groin with or without pain, irritability, and redness. An attempt at reducing the incarcerated hernia by applying gentle pressure from the bottom of the hernia toward the internal ring should be undertaken but may require conscious sedation to facilitate muscle relaxation and to provide analgesia to achieve successful reduction. Sedation or narcotic analgesia must be used judiciously and with appropriate monitoring in neonates and ill-appearing children. The only exception to attempting to perform reduction is in the case of a long-standing incarceration with signs and symptoms of peritonitis and strangulation of the hernia.

## Differential Diagnosis

Although the primary components of the differential diagnosis are those defined above (hernia, communicating hydrocele, hydrocele of the spermatic cord, and hydrocele), additional diagnoses should be kept in mind and ruled out (Table 2). Lipoma of the spermatic cord may

be difficult to differentiate from a hernia filled with omentum on both physical examination and ultrasonography, thereby requiring surgical exploration to differentiate. The incidence of torsion of the testis is highest during the neonatal period and adolescence. In neonatal torsion, the hard testis is painless and the cord is normal on palpation. Torsion of the testis or a testicular appendage presents as an acute process that in adolescents is painful and may be confused with acute pain from an incarcerated hernia. The scrotal examination should allow the examiner to distinguish torsion from an incarcerated hernia; in the latter the proximal cord cannot be discerned but the testis can, whereas in the former fullness of the distal cord may be palpable, indicating the point of torsion. Prolonged torsion may be associated with the development of a hydrocele, making the testis difficult to palpate. The diagnosis may be very difficult in the undescended testis that undergoes torsion. The blue-dot sign may be seen, indicating the presence of a necrotic testicular appendage seen through a hydrocele and the scrotal skin. Trauma to the testis may result in painful swelling of the scrotum, often with associated ecchymosis. The history should lead to the performance of ultrasonography to assess the presence of hematocele around the testis and the integrity of the testis. Testes tumors often present as painless testicular masses without any palpable abnormalities of the cord or inguinal canal that should be determined on physical examination, ultrasonography, and ultimately surgical exploration.

## Indications for Surgery

### Inguinal Hernia

Surgical repair of an inguinal hernia is generally advised shortly after its diagnosis is made given the significant rate

Table 2. **Differential Diagnosis of an Inguinoscrotal Swelling**

<u>Inguinal hernia</u>
<u>Communicating hydrocele</u>
<u>Noncommunicating hydrocele</u>
<u>Hydrocele of the spermatic cord</u>
Torsion of the testis or a testicular appendage
Lipoma of the spermatic cord
Hematocele
Epididymitis
Varicocele
Testicular tumors
Suppurative inguinal lymphadenitis

and risk of associated complications. In the absence of incarceration or for an easily reducible hernia, outpatient surgery can be performed within a few weeks. Surgery should be performed more urgently if there is moderate difficulty in successfully reducing the hernia. In either case, the parents should be advised to return if signs and symptoms of incarceration occur. For hernias that are difficult to reduce or require sedation, surgery should be performed with even greater urgency; an irreducible hernia requires immediate exploration. Hernias in premature infants can be repaired before hospital discharge. However, surgery may need to be delayed in extremely low-birth-weight (<1500 g) or premature infants and in children with congenital heart disease, pulmonary disease, sepsis, or metabolic disease because of the increased risk of anesthesia. The timing of operation for premature infants with reducible inguinal hernias is controversial and is the basis for a current multicenter clinical trial.

### Hydroceles

Communicating and noncommunicating hydroceles (Figure 3) have the potential to resolve spontaneously in infants and can therefore be observed until age 1 year and then corrected if it is still present or if the hydrocele enlarges. Hydroceles of the spermatic cord do not tend to resolve spontaneously but seldom pose urgency for repair; therefore, these should be repaired after age 1 year as well.

## Surgical Considerations

### Surgical Technique

Pediatricians should be familiar with the salient surgical steps of hernia repair, leading to the ligation of the hernia sac at the level of the internal ring. A small transverse



Figure 3. Intraoperative photograph of a left hydrocele exposed through a scrotal incision. The large volume of fluid can be seen through the thin wall of the tunica vaginalis.

incision is made in the lowest inguinal skin crease, and dissection proceeds to the external oblique aponeurosis, which is incised, if needed, to reach the internal ring. The ilioinguinal nerve is avoided, and the cremaster muscle fibers are gently teased apart, exposing the hernia sac on the anteromedial surface of the spermatic cord. The sac is gently separated free from the spermatic vessels and vas deferens and then divided. Proximally, the sac is gently dissected free to the level of the internal ring, where it is ligated after checking for the absence of intra-abdominal contents (Figure 4). The distal sac may be left in place or excised. A hydrocele should be drained if present. The wound is closed in layers and local anesthetic placed in the area of the ilioinguinal nerve and in the subcutaneous tissue.

### Laparoscopic Herniorrhaphy

Despite the popularity of laparoscopic hernia repair in adults, the various available techniques have not been widely adopted for herniorrhaphy in children given the small incision, rapidity of the procedure, and high success rate of the standard open technique. A multicenter series of 933 laparoscopic repairs reported recurrent hernias in 3.4% (follow-up, 2 months to 7 years), a rate higher than after open repair. (1) However, there appears to be an advantage in identification of contralateral inguinal hernia, cosmesis, and less postoperative analgesia with laparoscopic approaches. (2)(3)

### Incarcerated Inguinal Hernia

An irreducible hernia should be explored immediately. If the hernia reduces spontaneously on the induction of anesthesia, standard herniorrhaphy can be performed

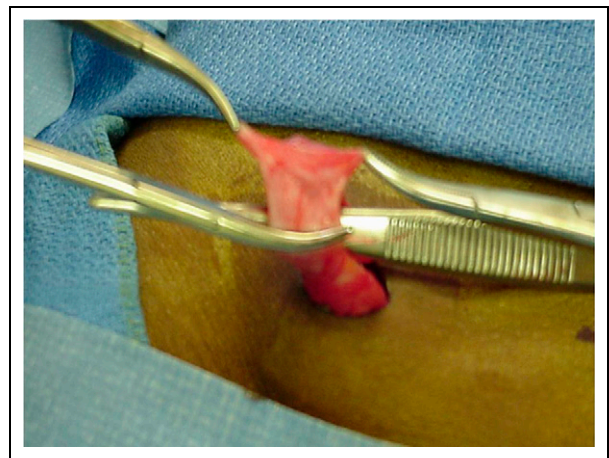


Figure 4. Intraoperative photograph of the hernia sac dissected from the spermatic cord up to the internal inguinal ring before ligation.

because nonviable bowel is unlikely to reduce spontaneously. However, if there is cloudy or bloody fluid or a foul odor after opening the sac, the reduced bowel should be identified and inspected for viability. If viable bowel remains entrapped, it can be reduced. If the bowel is ischemic or discolored, it is covered with warm, saline-soaked sponges and then examined after several minutes for signs of viability. If the viability of the bowel is uncertain or if there is necrosis present, the segment of bowel should be resected. Bowel resections are reported in 1.4% to 1.8% of incarcerated hernias and in 4% to 7% of irreducible cases.

### Exploration of the Contralateral Side

In the child with a unilateral hernia, the need to explore the contralateral side remains controversial. Infants with unilateral inguinal hernias have a patent contralateral processus vaginalis in 60% during the first few months of life. By age 2 years, 20% of these hernias are obliterated, and half of the remaining 40% became clinical hernias. The goal of contralateral exploration is to avoid asynchronous hernia development and its attendant risks and costs. However, surgical exploration can result in injury to the vas deferens, testes, and ilioinguinal nerve and may be unnecessary. Historically, routine bilateral exploration was undertaken because of the reported 60% to 70% incidence of a contralateral patent processus vaginalis. In a recent survey (4) 51% of surgeons perform routine contralateral exploration in premature infants, 40% perform

exploration in boys younger than 2 years, and 13% perform exploration in boys ages 2 to 5 years. In female patients, routine contralateral exploration was performed by 39% of surgeons in those younger than 5 years.

Several methods attempt to avoid contralateral explorations with negative results, such as probing, herniorrhaphy, and inducing a pneumoperitoneum to delineate structures. However, these attempts have insufficient accuracy. In contrast, transperitoneal diagnostic laparoscopy offers a rapid, direct, and accurate inspection of the contralateral internal inguinal ring by passing a 30° or 70° oblique scope through the open hernia sac (Figure 5). A meta-analysis of 964 laparoscopic evaluations identified a sensitivity of 99.4% and specificity of 99.5%. (5) One-third to half of children have a patent contralateral processus vaginalis, with higher rates in infants younger than 1 year. However, a patent processus does not necessarily infer a clinically significant hernia; the reported risk of developing a metachronous contralateral inguinal hernia after open unilateral hernia repair in children is 7.2%. (6) The question of exploring the contralateral side, however, remains unanswered because no study has followed up children with a known open contralateral internal inguinal ring and determined the rate of progression to a clinical hernia.

### Complications

Complications after inguinal hernia repair are unusual and may be related to technical factors (recurrence, iatrogenic cryptorchidism) or to the underlying process of incarceration (bowel ischemia, gonadal infarction, and testicular atrophy). Wound infection, although less than 1% of all reported series, is much more common in irreducible cases.

### Recurrent Hernia

The recurrence of an inguinal hernia after an uncomplicated open herniorrhaphy occurs in 0.5% to 1% of cases, up to 2% when performed in premature infants and in 3% to 6% after repair of an incarcerated hernia. Recurrences generally occur within 1 year (50%) or 2 years (75%) after the original surgery. (7) Recurrent hernias may result from failure to identify or to securely ligate the hernia sac at the original surgery, ligation of the sac distal to the internal ring, a tear in the sac in which

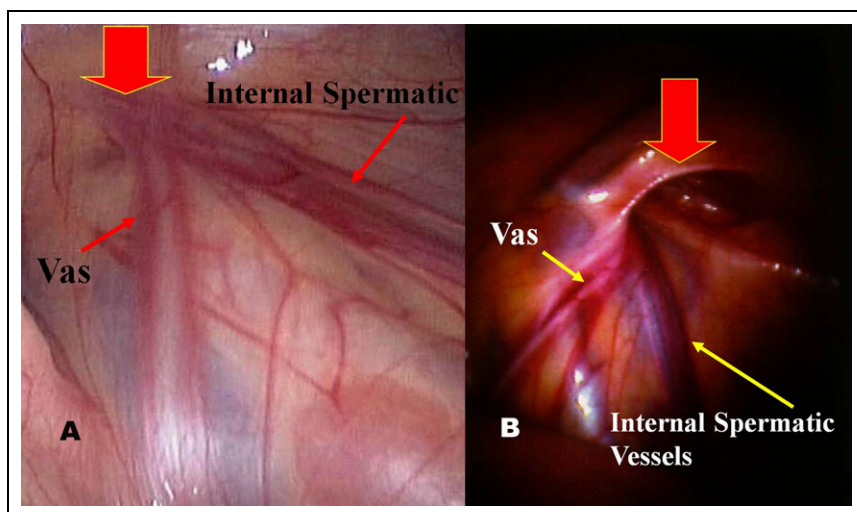


Figure 5. Intraoperative image through a 70° lens placed through the hernia sac demonstrating a closed (A) and open (B) contralateral internal inguinal ring. The ring is located at the junction of the vas deferens coming in medially and the descending internal spermatic ring.

a peritoneal strip remains along the cord structures, or the presence of increased intra-abdominal pressure, such as from a ventriculoperitoneal shunt. Recurrent hernias require additional surgery for repair.

### Iatrogenic Cryptorchidism

Iatrogenic cryptorchidism can occasionally result after hernia repair. It is important for the surgeon to ascertain the proper position of the testis before concluding surgery. If an undescended testis is observed preoperatively, a concurrent orchiopexy should be performed.

### Testis Infarction

Testicular infarction and its subsequent atrophy occurs in 4% to 12% of cases of an incarcerated hernia and in even an higher percentage when the hernia is not reducible. The mechanism is presumably due to compression of the gonadal vessels by the irreducible hernia, although some atrophic testes develop as a result of damage incurred during repair of a difficult incarcerated hernia. During surgery, if viability is unclear, the testis could be left in place and its viability assessed later.

## Summary

- Inguinoscrotal abnormalities in children are best understood by understanding the embryology of testicular descent and the failure of the processus vaginalis to properly obliterate.
- The inguinal hernia, communicating hydrocele, hydrocele of the spermatic cord, and scrotal hydrocele should be differentiated based on a history and physical examination in most cases, with selective use of ultrasonography.
- The urgency to surgically correct these entities depends on the nature of the hernia or hydrocele and the likelihood of incarceration or spontaneous resolution.

- Open standard herniorrhaphy remains the most common surgical approach, and concurrent transinguinal laparoscopy allows quick and accurate inspection of the contralateral internal inguinal ring and the need for bilateral repair of an inguinal hernia.

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## Suggested Readings

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## Parent Resources From the AAP at HealthyChildren.org

- English: <http://www.healthychildren.org/English/health-issues/conditions/abdominal/Pages/Inguinal-Hernia.aspx>
- Spanish: <http://www.healthychildren.org/spanish/health-issues/conditions/abdominal/paginas/inguinal-hernia.aspx>

## PIR Quiz

This quiz is available online at <http://pedsinreview.org>. NOTE: Learners can take *Pediatrics in Review* quizzes and claim credit online *only*. No paper answer form will be printed in the journal.

## New Minimum Performance Level Requirements

Per the 2010 revision of the American Medical Association (AMA) Physician's Recognition Award (PRA) and credit system, a minimum performance level must be established on enduring material and journal-based CME activities that are certified for *AMA PRA Category 1 Credit™*. In order to successfully complete 2013 *Pediatrics in Review* articles for *AMA PRA Category 1 Credit™*, learners must demonstrate a minimum performance level of 60% or higher on this assessment, which measures achievement of the educational purpose and/or objectives of this activity.

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1. You have just examined a 3-month-old boy for the first time. You notice the right hemiscrotum is larger than the left. There is a firm mass in the right hemiscrotum that is nontender and nonreducible, but you can palpate a testicle within the mass. A normal spermatic cord is palpable above the mass. The parents tell you the mass has been present since birth, does not vary in size throughout the day, but has become somewhat smaller since birth. Which of the following is the most likely diagnosis?
  - A. Hydrocele of the spermatic cord.
  - B. Inguinal hernia.
  - C. Scrotal hydrocele.
  - D. Testicular tumor.
  - E. Testicular torsion.
2. Which diagnostic modality is the most useful in diagnosing an inguinal hernia in a child?
  - A. Computed tomography.
  - B. Physical examination.
  - C. Radiographic herniogram.
  - D. Scrotal ultrasonography.
  - E. Transillumination.
3. A 13-year-old boy presents with a 2-hour history of right scrotal pain that began acutely. There is no history of trauma and no similar past episodes. Physical examination reveals tenderness to direct palpation of the upper portion of the testicle and epididymis, although the spermatic cord above the testicle is normal and nontender. The testicle is in a normal position in the scrotum. A blue dot is noticed in the upper scrotum overlying the point of maximum tenderness. The most likely diagnosis is:
  - A. Acute hydrocele.
  - B. Epididymitis.
  - C. Incarcerated inguinal hernia.
  - D. Testicular torsion.
  - E. Torsion of an appendix testis.
4. The scenario in which you would most likely find identical pathologic findings on the contralateral side is:
  - A. Communicating hydrocele.
  - B. Hydrocele of the cord.
  - C. Male left-sided inguinal hernia.
  - D. Male right-sided inguinal hernia.
  - E. Noncommunicating hydrocele.
5. Which of the following is most likely to resolve spontaneously?
  - A. Female inguinal hernia.
  - B. Hydrocele.
  - C. Hydrocele of the spermatic cord.
  - D. Male inguinal hernia.
  - E. Testicular torsion.



**Hernias and Hydroceles**  
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acids. With this change in nutrition, the lipemia retinalis completely resolved, xanthomas resorbed, and triglyceride values decreased to 375 mg/dL (4.2 mmol/L). He is followed every 1 to 2 months in lipid clinic to make nutritional adjustments that maintain his triglyceride values below 500 mg/dL (5.6 mmol/L).

#### Lessons for the Clinician

- Primary hypertriglyceridemia is an extremely rare disease.

- The goal of therapy in lipoprotein lipase deficiency is to maintain triglycerides below 500 mg/dL (5.6 mmol/L) to prevent pancreatitis.
- Dietary fats should be restricted in close consultation with endocrinology and nutrition.
- Abnormal rashes can indicate systemic disease and should not be relegated to “watch and wait” management.

*Suggested Readings for this article are at <http://pedsinreview.aappublications.org/content/37/5/215>.*

### Correction, Clarification

A sharp-eyed reader noted an error in the October 2013 article *Hernias and Hydroceles* (Palmer LS. *Pediatrics in Review*. 2013;34(10):457, DOI: 10.1542/pir.34-10-457). In the section “Laboratory and Radiologic Imaging,” paragraph 1, sentence 4 should begin with the word “Herniography” rather than “Herniorraphy.” The corrected sentence should read:

“Herniography is of historical interest in which water soluble contrast was injected infraumbilically into the abdomen and delayed pelvic radiographs were taken to see contrast in a hernia sac.”

The same reader suggested adding a more descriptive phrase to the caption for Figure 2. The updated caption should read:

Figure 2: Inguinal bulge present in the upper right hemiscrotum in a male (left) and into the right labium majus in a girl (right).

The online versions of the article have been updated to reflect these changes. The journal regrets the error and appreciates the clarification.

### ANSWER KEY FOR MAY 2016 PEDIATRICS IN REVIEW

Botulism: 1. A; 2. A; 3. E; 4. B; 5. A.

Metabolic Syndrome in Children and Adolescents: 1. A; 2. D; 3. E; 4. 3E; 5. C.

Pain Sedation Management: 1. B; 2. B; 3. D; 4. C; 5. C.



## **Hernias and Hydroceles**

Lane S. Palmer

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The online version of this article, along with updated information and services, is located on the World Wide Web at:

<http://pedsinreview.aappublications.org/content/34/10/457>

An erratum has been published regarding this article. Please see the attached page for:

<http://pedsinreview.aappublications.org/content/37/5/217.full.pdf>

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